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This is a list of biomass energy reports published by the Montana Department of Natural Resources and Conservation (DNRC). The 61 bioenergy reports selected for inclusion in the collection are final project reports containing generally useful, descriptive information on bioenergy concepts and systems that work or fail in Montana. The first section lists reports available only through the Montana State Library. The second section lists reports available upon request from DNRC. The last section lists articles about bioenergy reports or topics in a collection distributed as ***Montana Bionotes***.

Two programs contributed reports and articles to this collection. The Renewable Energy and Conservation Program (RECP) is funded by Montana's coal severance tax. The program was established to reduce the state's reliance on fossil fuels through the increased use of conservation, solar, wind, geothermal, small-scale hydro, and biomass energy alternatives. Reports of these other technologies are listed in the ***Guide to the Renewable Energy Report Library*** available upon request from DNRC. The Biomass Utilization and Cogeneration (BUC) Program is funded by a grant from the U.S. Department of Energy (DOE) and the Bonneville Power Administration (BPA). Under the grant, Montana offers funding for technical assistance to biomass energy projects conducted in Montana.

RENEWABLE ENERGY REPORT LIBRARY

The reports available in the Renewable Energy Report Library collection were for projects funded wholly or partially under the RECP or BUC Program. This collection was established to help meet DNRC's aim of sharing with the public the knowledge and information gained through these programs.

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NOTICE

The following reports were prepared through projects sponsored by the Montana Department of Natural Resources and Conservation. The reviews and opinions of authors expressed in the reports are not necessarily those of DNRC, BPA, DOE, or any of their employees.

COVER: Straw-fired corn dryer, Huntley, Montana, 1983

RENEWABLE ENERGY REPORT LIBRARY SERIES

Bergman, Jerald. ***Germplasm Evaluation and Selection of Safflower Oils and Co Products for Alternative Fuel Production*** #85-1065. December 1987.

Boucher, Robert J. ***Cogeneration Feasibility Study Comparison of Rankine vs Stirling Engines Adapted To A Solid-Fuel Combustor*** #RJB-661. November 1983.

_____. ***Adiabatic Bicoannular Reactor Development*** #83-1032. June 1989.

Bronec, Larry and Charles Bronec. ***Demonstration of an Alcohol Fuel Plant and Straw Boiler*** #437-811. June 1983.

Cozby Enterprises and MultiTech. ***Prototype Development of the Unitary Steam Engine*** #84-1046. February 1988.

Crane, Charles and MERDI. ***Central Biomass Combustion Facility Feasibility Study*** #303-782. July 1982.

Dratz, William and Dan Miles. ***An Empirical Study On The Use of Straight Alcohol Fuels Prepared From Feedstock Including Barley, Wheat, and Potatoes*** #423-801. September 1980.

Eagle Energy Systems, Inc. ***Feasibility and Design Study - 240 Ton Per Day Wood Refining Densification Facility With 2.0 Megawatts Cogeneration For Eureka, Montana*** #467-811. April 1983.

ECO Northwest, Ltd. ***Residential Wood Fuel Use Assessment*** #ECO-739. September 1984.

Frounfelker, Richard and Joseph Swartzbough. ***City of Helena: Evaluation and Design Of Solid Waste Resource Recovery Facility*** #311-800. March 1982.

Gauthier, Carol and Mike Gauthier. ***Stick Wood Boiler Demonstration Project For Residential Applications*** #320-811. September 1984.

Gent, F. M., General Electric Company, and Miller Brice, Flodin Lumber Company. ***A Three Megawatt Biomass-Fired Cogeneration Plant Feasibility Study.*** Helena, Montana. #FL-651. July 1983.

GeoProducts. ***Feasibility of a 15-MW Wood-fired and Geothermal Power Plant*** #GP-624. August 1986.

Goetz, Hank, Montana Forest and Conservation Experiment Station. ***Thinning on Steep Terrain With Low-Cost Cable Yarders*** #FCES-732. May 1986.

Hammaker, Geneva, Mary Lou Marino, Craig E. Simons, Paul O. Kresge and Steven J. Harvey. ***Liquid Biofuels in Montana - Assessment of the Oil Seed Resource*** #DPRA-595. February 1983.

Host, John R. ***Productivity and Cost of Processing Fuelbark in Montana*** #JH-066. April 1989.

Hunter, Robert, Brown and Caldwell Consulting Engineers. ***Montana Farms: Biogas/Cogeneration Feasibility Study*** #83-1028. November 1984.

Kania, Bruce, A.E. Montana, Inc. ***Fuel Ethanol Plant Near Amsterdam, Montana*** #457-811. December 1981.

Keegan, Charles E., III, and Tat Fong, Bureau of Business & Economic Research. ***Mill Residue Availability in Montana*** #BBER-997. October 1987.

_____. ***Montana Mill Residue Assessment And Simulation System—User's Guide*** #BBER-997A. October 1987.

Keegan, Charles E., III, Bureau of Business & Economic Research, and A. Lorin Hearst. ***Forest Residue Availability in Montana*** #BBER-021. November 1988.

Kemmis, Daniel. Bitterroot Resource Conservation and Development, Inc. ***Assessment of Expanding Wood Pellet Use in Mineral, Missoula, and Ravalli Counties*** #86-1069. February 1988.

Kent, Gary, Stuart Kilgore, Don Brelsford and Daniel Parks. ***Fuel Ethanol and Torula Yeast From Coniferous Wood Biomass - Thompson Falls, Montana*** #411-801. May 1981.

Kinzey, Bruce and W. E. Larson. ***Performance Optimization of a Farm-Scale Direct-Fired Biomass Furnace*** #84-1042. August 1986.

Law, James and Warren P. Scarrah. ***Low Energy Ethanol Dehydration Via Barley Absorption*** #441-811. January 1983.

Limaye, Dilip R., Shahzad Qasim and Howard E. Haines. ***Montana Biomass Cogeneration Manual: A Workshop Handbook*** #SRC-653. May 1983.

Little, Mark A., Lee Erickson and Gilbert F. Stallkneckt. ***Utilization of Biomass to Dry Whole Corn*** #83-1025. October 1984.

Matney Frantz Engineering. ***Dillon Incineration Project*** #468-811. July 1984.

_____. ***Municipal Solid Waste Recovery Station Feasibility Report*** (for Western Montana College). #WMC-740. May 1985.

McBride, John and Lauren McKinsey. ***Biogas Conversion Assessment Project.*** #412-781. December 1979.

MERDI. ***Fuel Ethanol Production By Fermentation In Intermediate-Sized Plants*** #430-800. June 1981.

Molde, Clint and William Larson, Montana State University. ***Potential for On Farm Biomass Gasification in Montana*** #84-1056. June 1987.

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Montana State University and Montana Department of Natural Resources and Conservation. ***Wood Pellet Study for the Residential Market*** #86-1069A. May 1986.

MultiTech. ***Fuel Ethanol Production From Wood Waste: Feasibility of a Plant at Anaconda, Montana.*** #451-811A. June 1982.

_____. ***Fuel Grade Ethanol Production Using Wood Waste (Residues) At Selected Sites in Montana*** #451-811. June 1985.

Mycotech Bioproducts, Inc. ***Biological Delignification of Wood and Straw for Ethanol Fuel Production via Solid State Culture*** #86-1066. September 1989.

Nuxoll, Tom and Dan Poling. ***Operation of a Portable Chipper to Chip Wastewood at Sawmills in Western Montana For Use as Boiler Fuel at a Nearby Pulp Mill*** #NPCC-621. August 1984.

Polette, Doug. ***Fire Tube Wood Boiler For Domestic Use*** #374-761. July 1978.

Renewable Technologies, Inc. ***Ambient Temperature Starch Hydrolysis For Barley*** #417-821. October 1983.

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Robbins, John E. ***Research Into The Factors Effecting The Bioconversion of Cattle Manure And Cellulosic Material Mixtures To Bio-Gas*** #486-761, 401-772, 403-782, 404-801, and 458-811. July 1982.

Scarrah, Warren P., Montana State University. ***Chemical Processing of Vegetable Oil Fuels to Prevent Polymerization*** #84-1041. August 1986.

_____. ***Conversion of Safflower Oil to Diesel via the Soap-Pyrolysis Process*** #86-1065. February 1989.

Shaffer, Daniel L., Chemical Engineering, Montana State University. ***Contamination of Diesel Engine Lubrication Oil by Plant Oil Derivative Fuels*** #84-1040. October 1986.

_____. ***Liquid Fuel and Chemicals From Renewable Cellulosic Biomass*** #83-1031. March 1985.

_____. ***Plant Oil Diesel Fuel: Lubrication System Contamination*** #86-1067. November 1988.

Smith, Sherwin K. and Hank Goetz. ***Timber Thinning Project For Utilization Of Wood Residue*** #317-811. March 1982.

Stoeckley, Robert. ***Electric Generation Home Wood-Fired Steam Engine*** #301-821. September 1983.

Stookey, Lawrence L. ***Construction and Operation of a Portable Still to Process Agricultural Culls for Fuel Grade Ethanol*** #439-811. June 1984.

Stout, B. B., J. A. Parker and Steve Ottenbreit. ***The Feasibility of Using Biomass For Fuel At the University of Montana*** #BS-733. October 1985.

Van Hersett, David G. and Rayson Brothers Logging Co. ***Libby Bioenergy Project*** #84-1045. May 1985.

Ward, David M. ***A Comprehensive Survey Of Biological Methane Production From Agricultural, Domestic and Industrial Resources of Montana*** #402-772, 402-782, and 435-811. July 1982.

Watters, Lawrence. ***Biomass Conversion Using Gasification and Catalytic Combustion: Process Design and Application*** #LJW-650. December 1984.

Wiatr, Stanley M., Eastern Montana College. ***Biomass Potential of Leafy Spurge*** #445-811A. June 1984.

Wiatr, Stanley M., Eastern Montana College. ***Energy and Biomass Potential of Cattails in Montana*** #445-811. August 1986.

_____. ***Fuel Beets—A Prospective Energy Crop For Montana*** #82-1005. March 1984.

Winsor, Herbert C. ***An Investigation Into Utilizing Wood Waste In The Lewis and Clark County Area For Space Heat In Medium-Sized Buildings*** #301-801. November 1980.

Wrench, Richard G. ***Development of an Efficient Fireplace Insert Stove*** #322-811. April 1982.

_____. ***Overall Efficiency Of An Integrated Energy Production Management System And a Fireplace Insert*** #84-1036. October 1984.

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The following publications can be requested from the Energy Division of DNRC, 1520 East Sixth Avenue, Helena, Montana 59620-2301 (406/444-6697). Some publications may be out of print at times throughout the year.

Haines, Howard E., Jr. ***Directory of Montana Biomass Energy Facilities.*** August 1988.

_____. ***Energy From Crops and Agricultural Residues In Montana.*** August 1987.

_____. ***Montana's Fuel Safflower Activities.*** September 1989.

Kelley, Patricia, Vicki Rieffenberger and Dan Vichorek. ***Saving Energy on Montana Farms and Ranches.*** January 1987.

Runnion, Ken, Raelen Williard, Howard E. Haines, Jr., Georgia Brensdal and Jeff Birkby. ***Montana Bioenergy Project Permitting Guidebook.*** July 1986.

Todd, Peggy, Jeff Birkby, Howard E. Haines, Jr., Carole Massman and Dennis McCahon. ***Wood Heat.*** June 1988.

MONTANA BIONOTES

Montana Bionotes is a collection of short articles written on various reports covering bioenergy topics and distributed by DNRC. The following list is current as of February 1989.

Haines, Howard E., Jr. "Breeding a Diesel Fuel Extender—A Potential New Montana Crop." August 1988.

_____. "High Tech Ag Industry in Montana's Future." January 1988.

_____. "Process Improvements Pave Way for Safflower Diesel Fuel." June 1989.

_____ and Dan Vichorek. "Montana Studies Use of Chicken Manure to Produce Methane for Heat, Electricity." January 1987.

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Hoban, Pat and Howard E. Haines, Jr. "Pellet Makers Ready For Boom." August 1988.

Todd, Peggy and Howard E. Haines, Jr. "Energy Potential of Leafy Spurge, Cattails and Fuel Beets." January 1987.

Vichorek, Dan. "Corn Cobs to be Burned in Place of Fossil Fuels." January 1987.

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_____. "Industry Investigates Wood and Coal Fuel to Replace Oil." January 1987.

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_____. "Solar Power Prevents Stock Water Freezing." January 1987.

_____ and Howard E. Haines, Jr. "Researchers Make Breakthrough in Adapting Vegetable-Based Diesel Fuel." August 1987.